Knowledge Graphs: Opportunities and Challenges

Abstract

With the explosive growth of artificial intelligence (AI) and big data, it has become vitally important to organize and represent the enormous volume of knowledge appropriately. As graph data, knowledge graphs accumulate and convey knowledge of the real world. It has been well-recognized that knowledge graphs effectively represent complex information; hence, they rapidly gain the attention of academia and industry in recent years. Thus to develop a deeper understanding of knowledge graphs, this paper presents a systematic overview of this field. Specifically, we focus on the opportunities and challenges of knowledge graphs. We first review the opportunities of knowledge graphs in terms of two aspects: (1) AI systems built upon knowledge graphs; (2) potential application fields of knowledge graphs. Then, we thoroughly discuss severe technical challenges in this field, such as knowledge graph embeddings, knowledge acquisition, knowledge graph completion, knowledge fusion, and knowledge reasoning. We expect that this survey will shed new light on future research and the development of knowledge graphs.